REMARKS

Claims 1-6 and 8-23 remain pending in the application. Favorable reconsideration of the application is respectfully requested in view of the following remarks.

I. REJECTION OF CLAIMS UNDER 35 USC §§ 102(b) and 103(a)

As with the previous Office Action, claims 1-6, 8-12 and 21-23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by on Keller et al., U.S. Patent No. 5,891,790. Claims 13-20 stand rejected under 35 U.S.C. §103(a) as being obvious over Keller et al. in view of other more tertiary references. Applicants respectfully traverse the rejections for at least the following reasons.

Claim 1 recites a method of growing a p-type nitride semiconductor material by molecular beam epitaxy (MBE), the method comprising supplying bis(cyclopentadienyl)magnesium (Cp_2Mg) during the growth process. In response to the previous Office Action, Applicants argued that Keller et al. does not teach or suggest growing a p-type nitride semiconductor material by *molecular beam epitaxy* (MBE) by supplying bis(cyclopentadienyl)magnesium (Cp_2Mg) during the growth process.

The Examiner essentially repeats the rejections made in the previous Office Action. Specifically, in both the rejections and response to Applicants' arguments, the Examiner refers to Keller et al. as teaching a method of growing a p-type nitride semiconductor material by MBE, citing column 2, lines 49-52. Note, however, that this passing reference to MBE does not describe in detail any MBE process. The entire disclosure, save for these lines, is devoted to MOCVD processes. The Examiner further states that Keller et al. teaches that their method includes supplying Cp_2Mg during the growth process, citing column 3, lines 63-67. Note, however, that the growth process referenced at this passage *is an MOCVD process*.

In this vein, in response to the previous Office Action, Applicants argued that when Keller et al. describes the use of Cp_2Mg to dope the gallium nitride with magnesium, such discussion is only in the context of an MOCVD process. For example, Keller et al. describes at column 3, lines 2-10 the basic construction of the MOCVD apparatus. In describing the use of the MOCVD apparatus, Keller et al. describes using Cp_2Mg to dope the gallium nitride. (See col. 3, lines 61-67.) There is no disclosure or suggestion in Keller et al., however, that Cp_2Mg can be used as a p-type dopant in any other process, including an MBE process as recited in claim 1.

Keller et al., therefore, teaches what the applicants admit was already known, namely using Cp_2Mg in connection with MOCVD. (See, e.g., application at page 2, last paragraph.)

In the Final Office Action, the Examiner has rejected these arguments with little explanation beyond reciting the same passages of Keller et al. as before. (See col. 2, lines 49-51 and col. 3, lines 63-67.) Applicants submit that the Examiner continues to misapply Keller et al. The following presents additional bases demonstrating that Keller et al. discloses supplying Cp_2Mg only during an MOCVD process.

For example, as stated in the current application, MOCVD processes are characterized in that the growth materials are supplied using a carrier gas flowing substantially parallel to the surface of the substrate upon which epitaxial growth is to take place. In contrast, MBE processes are carried out in an ultra-high vacuum environment. The growth materials are supplied from heated effusion cells, which travel across the MBE chamber to the substrate. (See application at page 1, last paragraph through page 2, first full paragraph.)

Keller et al. teaches only an MOCVD process employing carrier gases. Referring to Fig. 1, a carrier gas 22 is supplied to a gas line 24 and bubblers 32, 34, 36. Bubblers 32, 34, 36 contain various growth compounds, and the bubblers supply the growth compounds to the carrier gas. (See col. 3, lines 17-45.) One of the bubblers (e.g. bubbler 34) can be used to supply the Cp_2Mg dopant material. (See col. 3, lines 64-66.) Once the dopant and growth compounds flow into the main carrier gas line 24, growth

of the doped layer may take place on the substrate. (See col. 4, lines 1-5.) Similarly referring to Fig. 2, Block 106 represents flowing a growth gas into the growth chamber, the growth gas typically being a carrier gas bubbled through the growth compounds. (See col. 4, lines 46-49.)

Accordingly, Keller et al. teaches only that Cp_2Mg (and other growth compounds) may be introduced via a carrier gas, as is typical of MOCVD processes. Such use of a carrier gas would not work in an MBE process, which requires an ultra-high vacuum environment.

In addition, in the method of Keller et al., the p-type dopants are activated during the growth phase. (See col. 2, lines 61-63; col. 4, lines 1-5.) Such a process cannot be employed in an MBE process because of the ultra-high vacuum environment.

For at least these reasons, one skilled in the art would not understand Kellar et al. as disclosing or suggesting that Cp_2Mg may be used as the p-type dopant material in an MBE process, as recited in claim 1. For at least the same reasons, Kellar et al. does not disclose or suggest the features of the dependent claims. In addition, the tertiary references, cited against dependent claims 13-20, do not make up for the deficiencies of Kellar et al.

II. CONCLUSION

Accordingly, claims 1-6 and 8-23 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

/Mark D. Saralino/
Mark D. Saralino
Reg. No. 34,243

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The Keith Building
1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
(216) 621-1113